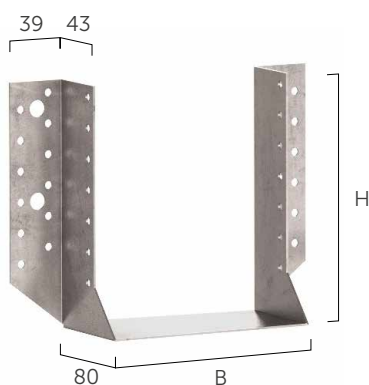


METAL HANGER WITH EXTERNAL WINGS

- Can be used on both timber and concrete
- Possibility of fastening the beam rotated in relation to its axis, with simultaneous application of vertical and lateral force
- Standardized, certified, fast and inexpensive system. Also suitable for fastening on OSB and for use with I-Joist



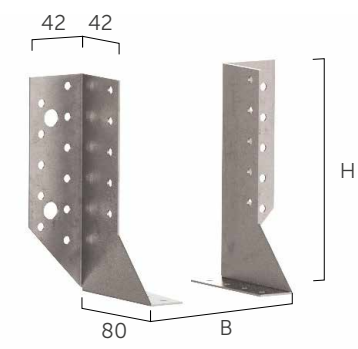
BSAS

standard

CODE	B [mm]	H [mm]	s [mm]	Anker nail LBA	n _H ⁽¹⁾ [pcs]	n _J ⁽²⁾ [pcs]			pcs
BSAS40110	40	110	2,0	Ø4 x 40	8	4	●	●	50
BSAS46117	46	117	2,0	Ø4 x 40	8	4	●	-	50
HT46137KE	46	137	2,0	Ø4 x 40	10	6	●	●	50
BSAS46207	46	207	2,0	Ø4 x 40	14	8	●	-	25
HT5070KE	50	70	2,0	Ø4 x 40	4	2	●	-	50
BSAS51105	51	105	2,0	Ø4 x 40	8	4	●	●	50
BSAS51135	51	135	2,0	Ø4 x 40	10	6	●	●	50
HT60100KE	60	100	2,0	Ø4 x 40	14	8	●	●	50
BSAS64128	64	128	2,0	Ø4 x 40	18	10	●	●	50
BSAS64158	64	158	2,0	Ø4 x 40	22	12	●	●	50
HT70125KE	70	125	2,0	Ø4 x 40	18	10	●	●	50
BSAS70155	70	155	2,0	Ø4 x 40	22	12	●	●	50
BSAS7690	76	90	2,0	Ø4 x 40	12	6	●	-	25
BSAS76152	76	152	2,0	Ø4 x 40	22	12	●	●	50
HT80120KE	80	120	2,0	Ø4 x 40	18	10	●	●	50
BSAS80140	80	140	2,0	Ø4 x 40	20	10	●	●	50
BSAS80150	80	150	2,0	Ø4 x 40	22	12	●	●	50
BSAS80180	80	180	2,0	Ø4 x 40	26	14	●	●	25
BSAS80210	80	210	2,0	Ø4 x 40	30	16	●	●	25
BSAS90145	90	145	2,0	Ø4 x 40	22	12	●	●	50
BSAS92184	92	184	2,0	Ø4 x 40	26	14	●	-	25
HT10090KE	100	90	2,0	Ø4 x 60	12	6	●	-	50
BSAS100120	100	120	2,0	Ø4 x 60	18	10	●	-	50
HT100140KE	100	140	2,0	Ø4 x 60	22	12	●	●	50
HT100160KE	100	160	2,0	Ø4 x 60	24	12	●	-	50
BSAS100170	100	170	2,0	Ø4 x 60	26	14	●	●	25
BSAS100200	100	200	2,0	Ø4 x 60	30	16	●	●	25
BSAS120120	120	120	2,0	Ø4 x 60	18	10	●	●	25
HT120160KE	120	160	2,0	Ø4 x 60	26	14	●	●	25
BSAS120190	120	190	2,0	Ø4 x 60	30	16	●	●	25
BSAS140140	140	140	2,0	Ø4 x 60	22	12	●	●	25
BSAS140160	140	160	2,0	Ø4 x 60	26	14	●	-	25
BSAS140180	140	180	2,0	Ø4 x 60	30	16	●	●	25



⁽¹⁾ n_H number of fasteners on the main beam

⁽²⁾ n_J number of fasteners on the secondary beam

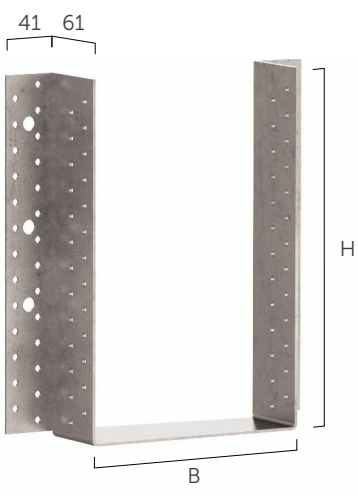


BSAD(*)

2 pieces



CODE	B [mm]	H [mm]	s [mm]			pcs
BSAD25100	25	100	2,0	●	-	25
BSAD25140	25	140	2,0	●	-	25
BSAD25180	25	180	2,0	●	-	25

(*) Not holding CE marking.
⁽¹⁾ n_H number of fasteners on the main beam
⁽²⁾ n_J number of fasteners on the secondary beam



BSAG

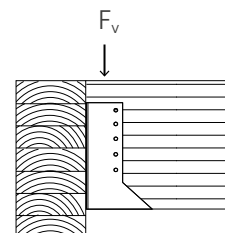
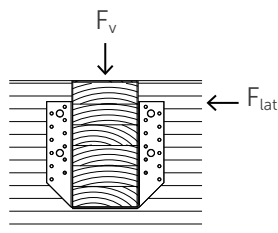
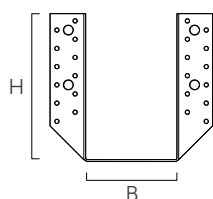
large size

CODE	B [mm]	H [mm]	s [mm]	Anker nail LBA	n _H ⁽¹⁾ [pcs]	n _J ⁽²⁾ [pcs]			pcs
BSAG100240	100	240	2,5	Ø4 x 60	46	30	●	●	20
BSAG100280	100	280	2,5	Ø4 x 60	54	34	●	●	20
BSAG120240	120	240	2,5	Ø4 x 60	46	30	●	●	20
BSAG120280	120	280	2,5	Ø4 x 60	54	34	●	●	20
BSAG140240	140	240	2,5	Ø4 x 60	46	30	●	●	20
BSAG140280	140	280	2,5	Ø4 x 60	54	34	●	●	20
BSAG160160	160	160	2,5	Ø4 x 60	30	18	●	●	15
BSAG160200	160	200	2,5	Ø4 x 60	38	22	●	●	15
BSAG160240	160	240	2,5	Ø4 x 60	46	30	●	●	15
BSAG160280	160	280	2,5	Ø4 x 60	54	34	●	●	15
BSAG160320	160	320	2,5	Ø4 x 60	62	38	●	●	15
BSAG180220	180	220	2,5	Ø4 x 60	42	26	●	●	10
BSAG180280	180	280	2,5	Ø4 x 60	54	34	●	●	10
BSAG200200	200	200	2,5	Ø4 x 60	38	22	●	●	10
BSAG200240	200	240	2,5	Ø4 x 60	46	30	●	●	10

⁽¹⁾ n_H number of fasteners on the main beam
⁽²⁾ n_J number of fasteners on the secondary beam

STRUCTURAL VALUES

TIMBER-TO-TIMBER JOINT PARTIAL/TOTAL NAILING⁽¹⁾



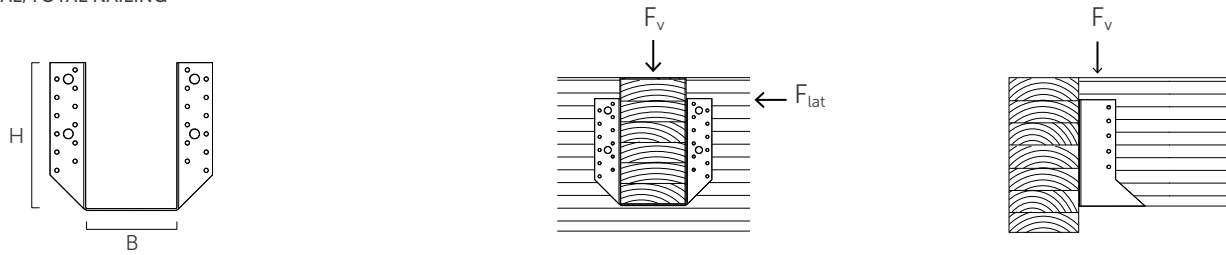
BSAS - STANDARD

			PARTIAL NAILING				FULL NAILING			
B [mm]	H [mm]	LBA nails d x L [mm]	fastening number		characteristic values		fastening number		characteristic values	
			n _H ⁽²⁾ pcs	n _J ⁽³⁾ pcs	R _{v,k} [kN]	R _{lat,k} [kN]	n _H ⁽²⁾ pcs	n _J ⁽³⁾ pcs	R _{v,k} [kN]	R _{lat,k} [kN]
40(*)	110	Ø4 x 40	8	4	8,7	1,9	-	-	-	-
46(*)	117	Ø4 x 40	8	4	9,0	2,1	-	-	-	-
46(*)	137	Ø4 x 40	10	6	11,8	2,4	-	-	-	-
46(*)	207	Ø4 x 40	14	8	16,9	2,9	-	-	-	-
50(*)	70	Ø4 x 40	4	2	3,6	1,3	-	-	-	-
51(*)	105	Ø4 x 40	8	4	8,1	2,3	-	-	-	-
51(*)	135	Ø4 x 40	10	6	11,5	2,6	-	-	-	-
60	100	Ø4 x 40	8	4	7,6	2,6	14	8	13,0	4,9
64	128	Ø4 x 40	10	6	10,9	3,6	18	10	19,2	5,9
64	158	Ø4 x 40	12	6	15,0	3,6	22	12	26,3	6,7
70	125	Ø4 x 40	10	6	10,5	3,7	18	10	18,6	6,2
70	155	Ø4 x 40	12	6	15,0	3,8	22	12	26,3	7,1
76	90	Ø4 x 40	6	4	5,9	2,9	12	6	10,4	4,4
76	152	Ø4 x 40	12	6	15,0	3,9	22	12	26,3	7,4
80	120	Ø4 x 40	10	6	9,9	4,0	18	10	17,5	6,6
80	140	Ø4 x 40	10	6	12,3	4,0	20	10	22,5	6,7
80	150	Ø4 x 40	12	6	14,8	4,0	22	12	26,3	7,6
80	180	Ø4 x 40	14	8	18,8	4,8	26	14	30,0	8,4
80	210	Ø4 x 40	16	8	18,8	4,8	30	16	33,8	9,1
90	145	Ø4 x 40	12	6	14,2	4,2	22	12	25,7	8,0
92	184	Ø4 x 40	14	8	18,8	5,2	26	14	30,0	9,0
100	90	Ø4 x 60	6	4	8,7	4,8	12	6	15,2	7,2
100	120	Ø4 x 60	10	6	15,3	7,0	18	10	27,1	11,7
100	140	Ø4 x 60	12	6	18,9	6,5	22	12	33,1	12,3
100	160	Ø4 x 60	12	6	18,9	6,5	22	12	33,1	12,3
100	170	Ø4 x 60	14	8	23,6	7,7	26	14	37,8	13,5
100	200	Ø4 x 60	16	8	23,6	7,7	30	16	42,5	14,6
120	120	Ø4 x 60	10	6	15,3	7,0	18	10	27,1	11,7
120	160	Ø4 x 60	14	8	23,6	8,5	26	14	37,8	14,9
120	190	Ø4 x 60	16	8	23,6	8,5	30	16	42,5	16,2
140	140	Ø4 x 60	12	6	18,9	7,4	22	12	33,1	14,3
140	160	Ø4 x 60	14	8	23,6	9,1	26	14	37,8	16,0
140	180	Ø4 x 60	16	8	23,6	9,1	30	16	42,5	17,5

⁽¹⁾ It cannot be to completely nailed

STRUCTURAL VALUES

TIMBER-TO-TIMBER JOINT PARTIAL/TOTAL NAILING⁽¹⁾



BSAG - LARGE SIZE

			PARTIAL NAILING				FULL NAILING			
B [mm]	H [mm]	LBA nails d x L [mm]	fastening number		characteristic values		fastening number		characteristic values	
			n _H ⁽²⁾ pcs	n _J ⁽³⁾ pcs	R _{v,k} [kN]	R _{lat,k} [kN]	n _H ⁽²⁾ pcs	n _J ⁽³⁾ pcs	R _{v,k} [kN]	R _{lat,k} [kN]
100	240	Ø4 x 60	24	16	40,7	10,7	46	30	75,6	19,9
100	280	Ø4 x 60	28	18	47,3	10,8	54	34	85,1	20,3
120	240	Ø4 x 60	24	16	40,7	12,3	46	30	75,6	22,9
120	280	Ø4 x 60	28	18	47,3	12,6	54	34	85,1	23,5
140	240	Ø4 x 60	24	16	40,7	13,7	46	30	75,6	25,6
140	280	Ø4 x 60	28	18	47,3	14,1	54	34	85,1	26,4
160	160	Ø4 x 60	16	10	21,2	11,1	30	18	41,6	19,9
160	200	Ø4 x 60	20	12	30,7	12,3	38	22	56,7	22,4
160	240	Ø4 x 60	24	16	40,7	15,0	46	30	75,6	27,9
160	280	Ø4 x 60	28	18	47,3	15,5	54	34	85,1	29,0
160	320	Ø4 x 60	32	20	52,0	15,9	62	38	94,6	30,0
180	220	Ø4 x 60	22	14	35,7	15,2	42	26	66,2	27,0
180	280	Ø4 x 60	28	18	47,3	16,7	54	34	85,1	31,3
200	200	Ø4 x 60	20	12	30,7	13,7	38	22	56,7	25,0
200	240	Ø4 x 60	24	16	40,7	16,9	46	30	75,6	31,3

NOTES

- ⁽¹⁾ For total or partial nailing patterns please refer to the guidelines reported at page 7.
- ⁽²⁾ n_H = number of fasteners on the main beam.
- ⁽³⁾ n_J = number of fasteners on the secondary beam.

GENERAL PRINCIPLES

- Characteristic values are consistent with EN 1995-1-1 and in accordance with ETA.
- Design values can be obtained from characteristic values as follows:

$$R_d = \frac{R_k \cdot k_{mod}}{\gamma_M}$$

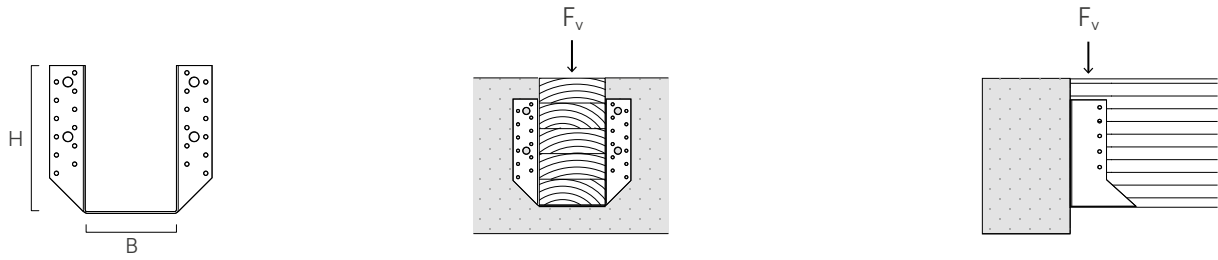
The coefficients γ_M and k_{mod} should be taken according to the current regulations used for the calculation.

- For the calculation process a timber characteristic density $\rho_k = 350 \text{ kg/m}^3$ has been considered.
- Dimensioning and verification of the timber elements must be carried out separately.
- In case of $F_{v,k}$ parallel to the grain, partial nailing is required.
- In case of combined loading the following verification shall be satisfied:

$$\left(\frac{F_{v,d}}{R_{v,d}}\right)^2 + \left(\frac{F_{lat,d}}{R_{lat,d}}\right)^2 \leq 1$$

STRUCTURAL VALUES

TIMBER-TO-CONCRETE JOINT CHEMICAL ANCHOR⁽¹⁾



BSAS - STANDARD

B [mm]	H [mm]	FASTENERS		CHARACTERISTIC VALUES	
		anchor V-NEX ⁽²⁾ [n _{bolt} - Ø x L] ⁽³⁾	nails LBA [n ₃ - Ø x L] ⁽⁴⁾	R _{v,k} timber [kN]	R _{v,k} steel [kN]
40 ^(*)	110	2 - M8 x 110	4 - Ø4 x 40	11,3	10,6
46 ^(*)	137	2 - M10 x 110	6 - Ø4 x 40	15,0	13,2
51 ^(*)	105	2 - M8 x 110	4 - Ø4 x 40	11,3	10,6
51 ^(*)	135	2 - M10 x 110	6 - Ø4 x 40	15,0	13,2
60	100	2 - M8 x 110	8 - Ø4 x 40	18,8	10,6
64	128	4 - M10 x 110	10 - Ø4 x 40	22,5	26,4
64	158	4 - M10 x 110	12 - Ø4 x 40	26,3	26,4
70	125	4 - M10 x 110	10 - Ø4 x 40	22,5	26,4
70	155	4 - M10 x 110	12 - Ø4 x 40	26,3	26,4
76	152	4 - M10 x 110	12 - Ø4 x 40	26,3	26,4
80	120	4 - M10 x 110	10 - Ø4 x 40	22,5	26,4
80	140	4 - M10 x 110	10 - Ø4 x 40	22,5	26,4
80	150	4 - M10 x 110	12 - Ø4 x 40	26,3	26,4
80	180	4 - M10 x 110	14 - Ø4 x 40	30,0	26,4
80	210	4 - M10 x 110	16 - Ø4 x 40	33,8	26,4
90	145	4 - M10 x 110	12 - Ø4 x 40	26,3	26,4
100	140	4 - M10 x 110	12 - Ø4 x 60	33,1	26,4
100	170	4 - M10 x 110	14 - Ø4 x 60	37,8	26,4
100	200	4 - M10 x 110	16 - Ø4 x 60	42,6	26,4
120	120	4 - M10 x 110	10 - Ø4 x 60	28,4	26,4
120	160	4 - M10 x 110	14 - Ø4 x 60	37,8	26,4
120	190	4 - M10 x 110	16 - Ø4 x 60	42,6	26,4
140	140	2 - M10 x 110	12 - Ø4 x 60	33,1	13,2
140	180	4 - M10 x 110	16 - Ø4 x 60	42,6	26,4

^(*) Partial nailing

NOTES

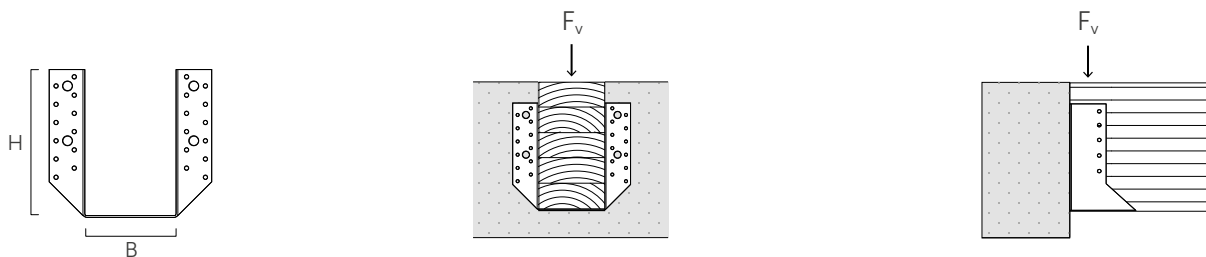
⁽¹⁾ For fixing on the concrete the two top holes must always be fixed and the anchors shall be positioned symmetrically with respect to the vertical axis of the hanger.
⁽²⁾ Chemical anchor V-NEX according to ETA-20/0363 with threaded rods (type INA) in minimum steel class S.8.

⁽³⁾ n_{bolt} = number of anchors on the concrete support.

⁽⁴⁾ n₃ = number of fasteners on the secondary beam.

STRUCTURAL VALUES

TIMBER-TO-CONCRETE JOINT CHEMICAL ANCHOR⁽¹⁾



BSAG - LARGE SIZE

B [mm]	H [mm]	FASTENERS		CHARACTERISTIC VALUES	
		anchor V-NEX ⁽²⁾ [n _{bolt} - Ø x L] ⁽³⁾	nails LBA [n _J - Ø x L] ⁽⁴⁾	R _{v,k timber} [kN]	R _{v,k steel} [kN]
100	240	6 - M12 x 130	30 - Ø4 x 60	75,6	59,4
100	280	6 - M12 x 130	34 - Ø4 x 60	85,1	59,4
120	240	6 - M12 x 130	30 - Ø4 x 60	75,6	59,4
120	280	6 - M12 x 130	34 - Ø4 x 60	85,1	59,4
140	240	6 - M12 x 130	30 - Ø4 x 60	75,6	59,4
140	280	6 - M12 x 130	34 - Ø4 x 60	85,1	59,4
160	160	4 - M12 x 130	18 - Ø4 x 60	47,3	39,6
160	200	6 - M12 x 130	22 - Ø4 x 60	56,7	59,4
160	240	6 - M12 x 130	30 - Ø4 x 60	75,6	59,4
160	280	6 - M12 x 130	34 - Ø4 x 60	85,1	59,4
160	320	6 - M12 x 130	38 - Ø4 x 60	94,6	59,4
180	220	6 - M12 x 130	26 - Ø4 x 60	66,2	59,4
180	280	6 - M12 x 130	34 - Ø4 x 60	85,1	59,4
200	200	6 - M12 x 130	22 - Ø4 x 60	56,7	59,4
200	240	6 - M12 x 130	30 - Ø4 x 60	75,6	59,4

NOTES

- ⁽¹⁾ For fixing on the concrete the two top holes must always be fixed and the anchors shall be positioned symmetrically with respect to the vertical axis of the hanger.
- ⁽²⁾ Chemical anchor V-NEX according to ETA-20/0363 with threaded rods (type INA) in minimum steel class 5.8.
- ⁽³⁾ n_{bolt} = number of anchors on the concrete support.
- ⁽⁴⁾ n_J = number of fasteners on the secondary beam.

GENERAL PRINCIPLES

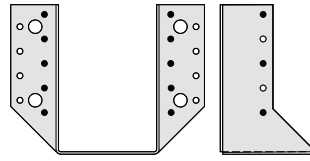
- Characteristic values are consistent with EN 1995-1-1 and in accordance with ETA.
- The connection design strength is the minimum between the design strength pertaining to the timber side (R_{v,d timber}) and the design strength of the steel part (R_{v,d steel}):

$$R_{v,d} = \min \left\{ \begin{array}{l} \frac{R_{v,k \text{ timber}} \cdot k_{mod}}{\gamma_M} \\ \frac{R_{v,k \text{ steel}}}{\gamma_{steel}} \end{array} \right.$$

- γ_{steel} should be taken as γ_{M2}
- The coefficients γ_M, γ_{M2} and k_{mod} should be taken according to the current regulations used for the calculation.
- For the calculation process a timber characteristic density $\rho_k = 350 \text{ kg/m}^3$ has been considered.
- Dimensioning and verification of timber and concrete elements must be carried out separately.
- The strength values of the connection system are valid under the calculation hypotheses listed in the table.

INSTALLATION - FASTENERS

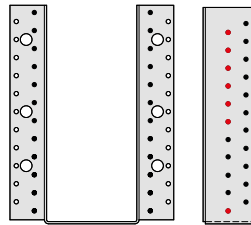
TIMBER-TO-TIMBER



BSAS

	main beam (n_H)	secondary beam (n_J)
PARTIAL NAILING ●	n_H nails positioned on the column closest to the lateral wing of the hanger	n_J nails with alternate pattern
FULL NAILING ●+○	n_H nails in all the holes	n_J nails in all the holes

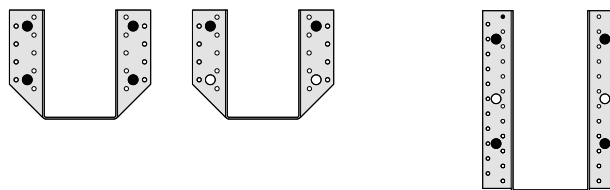
TIMBER-TO-TIMBER | large size



BSAG

	main beam (n_H)	secondary beam (n_J)
PARTIAL NAILING ●	n_H nails positioned on the column closest to the lateral wing of the hanger	● n_J nails with alternate pattern, avoiding the holes marked in red
FULL NAILING ●+○	n_H nails in all the holes	● n_J nails with alternate pattern, avoiding the holes marked in red

TIMBER-TO-CONCRETE



BSAS

BSAG

	main beam (n_H)	secondary beam (n_J)
FASTENING OF THE ANCHORS n_{BOLT} ●	the n_{bolt} anchors shall be placed symmetrically with respect to the vertical axis. At least two anchors should be positioned in the top holes	n_J nails positioned according to full nailing patterns as shown above